

IN THE CLAIMS:

Claim 1 (Original): An inverter device for a liquid crystal display, comprising:

- a transformer for receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of a backlight lamp;
- a low path switching part selectively connecting a low path of the backlight lamp with a ground voltage source in response to an external inverter ON/OFF signal; and
- a shutdown circuit for receiving a voltage input through the low path of the backlight lamp to monitor for a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal.

Claim 2 (Original): The device according to claim 1, wherein the low path switching part includes:

- a first driver selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal; and
- a first switching part connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver.

Claim 3 (Original): The device according to claim 2, the first driver includes:

a first switch being switched in response to the inverter ON/OFF signal; and
a second switch supplying the inverter drive voltage to the first switching part
in response to a state of the first switch.

Claim 4 (Original): The device according to claim 3, wherein the first switching part
includes:

first and second field effect transistors connected in series between the low
path of the backlight lamp and the ground voltage source for connecting the low path
of the backlight lamp to the ground voltage source in response to an output signal of
the second switch; and
a resistor connected between the low path of the backlight lamp and the first
field effect transistor.

Claim 5 (Original): The device according to claim 1, wherein the shutdown circuit
includes:

a second driver selectively supplying the inverter drive voltage to the low path
of the backlight lamp in response to the shutdown ON/OFF signal;
a second switching part providing one of an enabling and disabling shutdown
function for monitoring for the presence or absence of a malfunction of the backlight
lamp in response to an output signal of the second driver; and

an error amplifier monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part.

Claim 6 (Original): The device according to claim 5, wherein the second driver includes:

a third switch being switched in response to the shutdown ON/OFF signal; and
a fourth switch supplying the inverter drive voltage to the second switching part in response to a state of the third switch.

Claim 7 (Original): The device according to claim 6, wherein the second switching part includes:

third and fourth field effect transistors connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch; and

a resistor connected between the low path of the backlight lamp and the third field effect transistor.

Claim 8 (Original): The device according to claim 7, wherein the second switching part includes:

a first capacitor connected between a drain terminal of the third field effect transistor and a drain terminal of the fourth field effect transistor; and
a second capacitor connected between the drain terminal of the fourth field effect transistor and the ground voltage source.

Claim 9 (Original): A backlight lamp monitoring device for a liquid crystal display, comprising:

a plurality of backlight lamps; and
a plurality of inverters, each receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage, and supplying the AC lamp drive voltage to a high path of each of the backlight lamps,
wherein the inverters selectively connect a low path of each of the backlight lamps with a ground voltage source in response to an external inverter ON/OFF signal, and the inverters receive a voltage input through the low path of the backlight lamp to perform a shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal.

Claim 10 (Original): The device according to claim 9, wherein each of the inverters includes:

a transformer for receiving the inverter drive voltage (Vin), converting the received drive voltage into the AC lamp drive voltage, and supplying the AC lamp drive voltage to the high path of the backlight lamp;

a low path switching part for selectively connecting the low path of the backlight lamp with the ground voltage source in response to the external inverter ON/OFF signal; and

a shutdown circuit for receiving the voltage input through the low path of the backlight lamp to monitor for the presence or absence of a malfunction of the backlight lamp in response to the external shutdown ON/OFF signal.

Claim 11 (Original): The device according to claim 10, wherein the low path switching part includes:

a first driver for selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal; and

a first switching part for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver.

Claim 12 (Original): The device according to claim 11, wherein the first driver includes:

a first switch being switched in response to the inverter ON/OFF signal; and
a second switch for supplying the inverter drive voltage to the first switching part in response to a state of the first switch.

Claim 13 (Original): The device according to claim 12, wherein the first switching part includes:

first and second field effect transistors connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the second switch; and

a resistor connected between the low path of the backlight lamp and the first field effect transistor.

Claim 14 (Original): The device according to claim 10, wherein the shutdown circuit includes:

a second driver for selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the shutdown ON/OFF signal;
a second switching part for providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an output signal of the second driver; and

an error amplifier for monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part.

Claim 15 (Original): The device according to claim 14, wherein the second driver includes:

a third switch being switched in response to the shutdown ON/OFF signal; and
a fourth switch for supplying the inverter drive voltage to the second switching part in response to a state of the third switch.

Claim 16 (Original): The device according to claim 15, wherein the second switching part includes:

third and fourth field effect transistors connected in series between the low path of the backlight lamp and the ground voltage source for connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch; and

a resistor connected between the low path of the backlight lamp and the third field effect transistor.

Claim 17 (Original): The device according to claim 16, wherein the second switching part includes:

a first capacitor connected between a drain terminal of the third field effect transistor and a drain terminal of the fourth field effect transistor; and
a second capacitor connected between the drain terminal of the fourth field effect transistor and the ground voltage source.

Claim 18 (Original): A method for monitoring lamps of a liquid crystal display, comprising:

receiving an inverter drive voltage, converting the received drive voltage into an AC lamp drive voltage and supplying the AC lamp drive voltage to a high path of a backlight lamp;

selectively connecting a low path of the backlight lamp with a ground voltage source in response to an external inverter ON/OFF signal; and

receiving a voltage input through the low path of the backlight lamp to monitor for a malfunction of the backlight lamp in response to an external shutdown ON/OFF signal.

Claim 19 (Original): The method according to claim 18, wherein the step of selectively connecting a low path includes:

selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the inverter ON/OFF signal; and
connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the first driver.

Claim 20 (Original): The method according to claim 19, wherein the step of selectively supplying the inverter drive voltage includes:

switching a first switch in response to the inverter ON/OFF signal; and
supplying the inverter drive voltage to the low path of the backlight lamp in response to a state of the first switch.

Claim 21 (Original): The method according to claim 20, wherein the step of connecting the low path includes connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the second switch.

Claim 22 (Original): The method according to claim 18, wherein the step of receiving a voltage input includes:

selectively supplying the inverter drive voltage to the low path of the backlight lamp in response to the shutdown ON/OFF signal;

providing one of an enabling and disabling shutdown function for monitoring for the presence or absence of a malfunction of the backlight lamp in response to an output signal of the second driver; and

monitoring for the presence or absence of a malfunction of the backlight lamp when the shutdown function is enabled by the second switching part.

Claim 23 (Original): The method according to claim 22, wherein the step of selectively supplying the inverter drive voltage includes:

switching a third switch in response to the shutdown ON/OFF signal; and

supplying the inverter drive voltage to the second switching part in response to a state of the third switch.

Claim 24 (Original): The method according to claim 23, wherein the step of providing one of an enabling and disabling shutdown function includes connecting the low path of the backlight lamp to the ground voltage source in response to an output signal of the fourth switch.